

REMARKS

Claims 16-38 are presently pending for the Examiner's review and consideration. Of these, claims 16, 18, and 25 have been amended, and claims 29-38 have been added. Claims 1-15, which have been withdrawn from consideration, are now cancelled without prejudice, and the right is reserved to prosecute these and other presently unclaimed matter in a divisional or other continuing application.

The indication of allowable subject matter in claims 25-28 is sincerely appreciated. New claim 38 includes the recitations of claim 25 in an independent form, except for amendments to overcome the section 112, second paragraph, as explained below.

Pursuant to the objection to the drawings, Fig. 1 has been amended to label this figure as prior art. A Replacement Sheet is submitted herewith to replace the previously submitted drawing sheet. Also, the specification has been amended to correct a recurring typographical error by changing occurrences of "a typical" to "atypical."

Additionally, claims 16-28 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite due to the word, "atypical," which is argued in the office action that it is not defined in the claim or the specification. A definition of "typical surface" qualities is, in fact, provided in the specification, in paragraph [0007] of the publication, and thus one of ordinary skill in the art would understand what atypical surface qualities are. In any event, the objection and rejection are now moot, since the claims 16 and 25 have been amended to define the surface qualities in terms of preventing or inhibiting molecular bonding, which is supported, for instance, in the above cited paragraph. One of ordinary skill in the art at the time of the filing would find this definition to be definite.

The amendments and new claims are fully supported by the originally filed specification, claims, and drawings. For convenience, reference is made to the corresponding paragraphs of the published application. For instance, the amendments to claims 16 and 33 are supported, for example in paragraph [0031] of the published application. Claim 18 has been amended in accordance with the changes to claim 16. Claims 32 and 37 are supported in Fig. 4B and its description. Claim 31 is supported, for instance in Figs. 4A, 4A, and 5B-5D and the description thereof.

Claims 16-18 and 23-24 were rejected under 35 U.S.C. § 102(b) as anticipated by Linn, and claims 19 and 22 were rejected under 35 U.S.C. § 103(a) over Linn in view of Murari. Claim 16 is directed to the method for fabricating a semiconductor structure, in which a substrate that has surface properties that substantially prevent or inhibit molecular bonding is provided with an intermediate layer. The intermediate layer also has surface

properties that substantially prevent or inhibit molecular bonding. A bonding layer is provided on the intermediate layer surface, and the intermediate layer is formed of a material that is substantially more resistant to polishing than the bonding layer. Thus, when the bonding layer is polished, the intermediate layer is used as a polishing stop.

The Office Action characterizes handle wafer 22 of Linn as an “intermediate layer”, and is said to have atypical properties before providing a bonding layer. In support of this, column 1, lines 16-39 of Linn is cited. Referring to the cited portion of Linn, it is clear that the handle wafer layer 22 is the layer that is eventually bonded to the remaining structure.

There is no teaching or suggestion in either of the references to configure and provide the intermediate layer as a polish stop. This claimed method provides the surprising advantage in that it allows the thickness of the bonding to be controlled easily to minimize its thickness, while enabling improvement of certain characteristics, such as thermal conduction across the bonding layer. Thus, claim 16, and claim 34, which also recites using the intermediate layer as a polishing stop, are novel and non-obvious over the references of record.

Claim 32 defines that the bonding layer is smooth to less than about 10 nm above the peaks of the intermediate layer to provide a surface that is capable of molecular bonding. Nowhere is this described or suggested in either of the references. This provides a surprising advantage, as described in paragraphs [0010] and [0032]-[0034] of the published application, in that this distance or less from the surface of the peaks surprisingly provides a highly optimized heat transfer from the further layer to the substrate. It would have been surprising to a person having ordinary skill in the art at the time of the invention to smooth the bonding layer to less than 10 nm from the intermediate layer peaks and that this thickness would provide highly improved heat transfer properties from the intermediate layer. Also, the resulting structure exploits the roughnesses to encourage heat transfer between the layers of the structure, while also allowing bonding to the further layer, as disclosed in the application.

Claim 34 further defines that the intermediate layer has a thermal conductivity coefficient that is higher than that of the substrate. This takes particular advantage of the surprising benefits described above, and is also thus believed to be novel and non-obvious over the cited references.

It is believed that the entire application is presently in condition for allowance.
Should any issues remain, a personal or telephonic interview is respectfully requested to
discuss the same in order to expedite the allowance of the application.

Respectfully submitted,

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Date

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AMENDMENTS TO THE DRAWINGS:

Please amend Fig. 1 as shown in redline in the Annotated Marked-Up Version.



ANNOTATED MARKED-UP VERSION

1/3

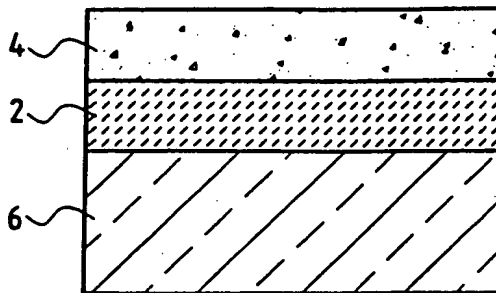


FIG.1
PRIOR ART

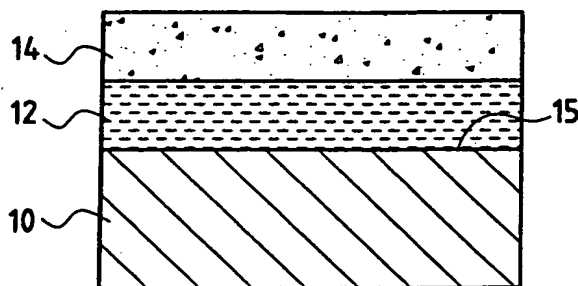


FIG.2

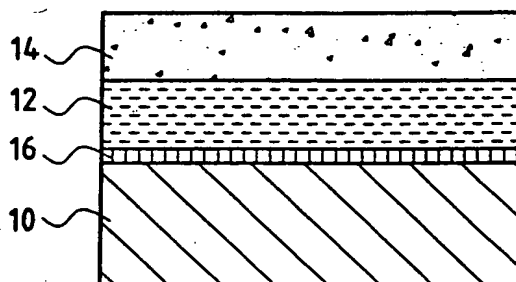


FIG.3

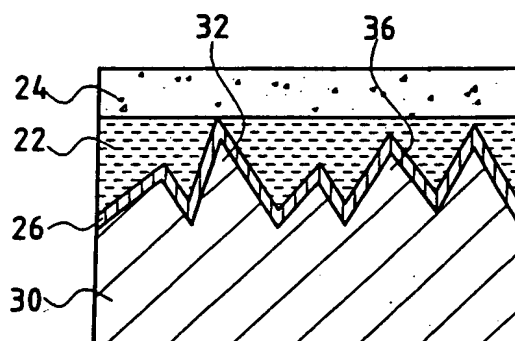


FIG.4A